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(Acanthocephala: Polymorphidae)

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MONORCHISM IN THORNY-HEADED WORMS
OF THE GENUS *BOLBOSOMA* PORTA, 1908
(ACANTHOCEPHALA: POLYMORPHIDAE)

By G.G. Galkina

The paper reports on monorchidic specimens of thorny-headed worms found in whale intestine.

The materials for the present report were collections of helminths from sei whales (*Balaenoptera borealis* Lesson), caught in antarctic waters and in the northern part of the Pacific Ocean in 1965. In the process of study of thorny-headed worms (*Bolbosoma turbinella* Diesing, 1851 and *Bolbosoma tuberculata* Skrjabin, 1970), anomalous specimens, containing only one testis each, were found.

Cases of monorchism in thorny-headed worms are already known. Thus Lühe (1912, from Petrochenko, 1956) described the presence of a single testis in *Acanthocephalus lucii* (Müller, 1776) - an intestinal parasite of fresh-water fishes. The normal testis in *A. lucii* had a length of 0.59 - 0.64 mm and a width of 0.43 mm. In a worm, containing one testis, the latter was 1.07 mm long and 0.61 wide, that is, considerably larger. Lühe also noted a similar phenomenon in *Acanthocephalus ranae* (Schränk, 1788), a frog parasite.

Bieler (1913, from Petrochenko, 1956) found monorchism in *Neoechinorhynchus agilis* (Rudolphi, 1819). He also mentioned that the testis dimensions in a

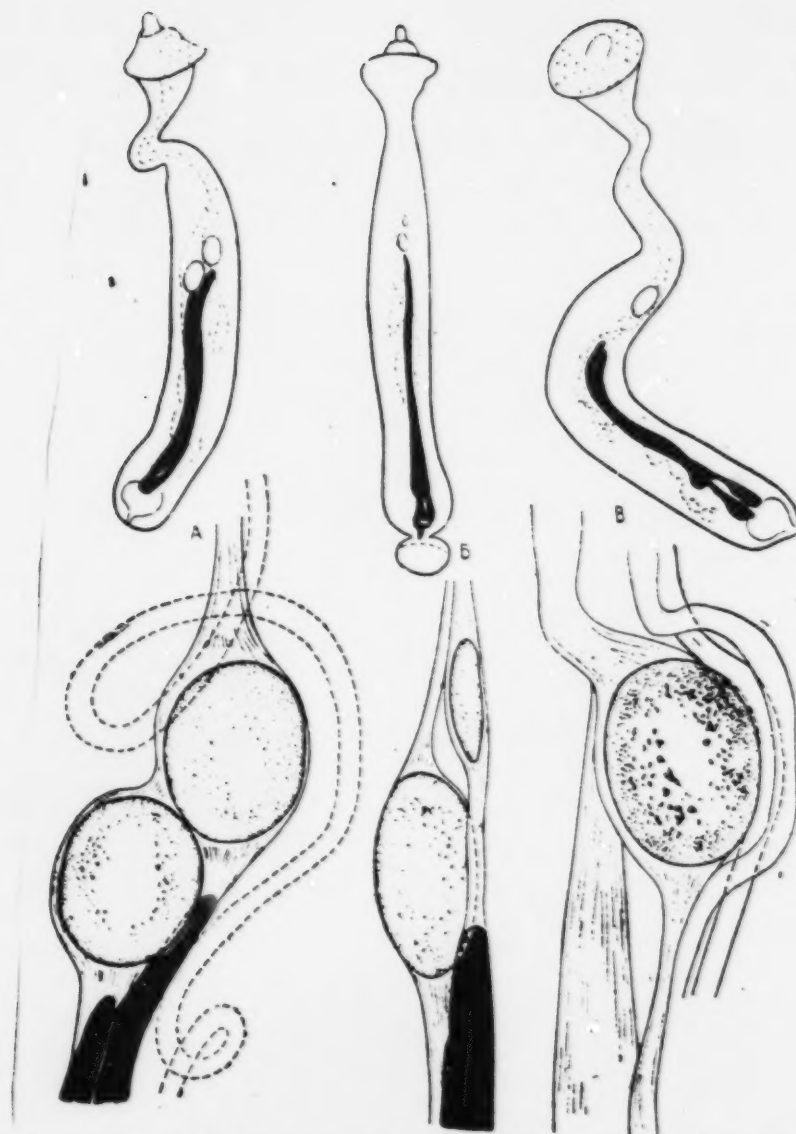


Fig. 1. A - over-all view of a thorny-headed worm *Bolbosoma tuberculata* with normally developed testes and enlarged view of the latter; B - intermediate form of thorny-headed worm of the same species and enlarged view of its abnormally developed testes; C - over-all view and testis of monorchidic specimen of thorny-headed worm *B. turberculata*.

monorchid thorny-headed worm were larger than the norm. The same author established a similar phenomenon in specimens of *A. lucii* and *A. ranae*, previously examined by Lühe. Bieler explained the origin of this deformity as the result of the fusion of both testes.

Achmerov and Dombrovskaja-Achmerova (1941) noted cases of monorchism in four male *Paracanthocephalus tenuirostris* Achmerov et Dombrovskaja-Achmerova, 1941 and in one male *P. curtus* Achmerov et Domb.-Achmerova, 1941 - parasites of the fishes of the Amur River. No other references to this phenomenon were found in the literature, so that the find of monorchid thorny-headed worms in whales is of definite interest.

In our material, monorchids of two species of thorny-headed worms were found in seven samples of helminths from sei whales. The dimensions of the testis in the monorchid worms were the most variable and occasionally did not exceed the dimensions of normal testes (Fig. 1, 2).

Thus, a single testis of *B. tuberculata* was 1.03 mm long and 0.76 mm wide. The dimensions of normally developed testes in a worm of this same species were: 1.01 X 0.75 mm and 0.93 X 0.76 mm. In another case, with an identical body length (17.0 mm), a monorchid thorny-headed worm *B. turbinella* had a testis with dimensions 1.25 X 1.12 mm, while in a worm with two testes, the latter were 1.24 - 1.18 mm long and 1.00 - 0.89 mm wide, respectively. At the same time, another monorchidic specimen of worm *B. turbinella* with a body length of 17.5 mm had a large globular testis with dimensions 1.60 X 1.50 mm. Comparative data on *B. turbinella* worms are shown in Table 1.

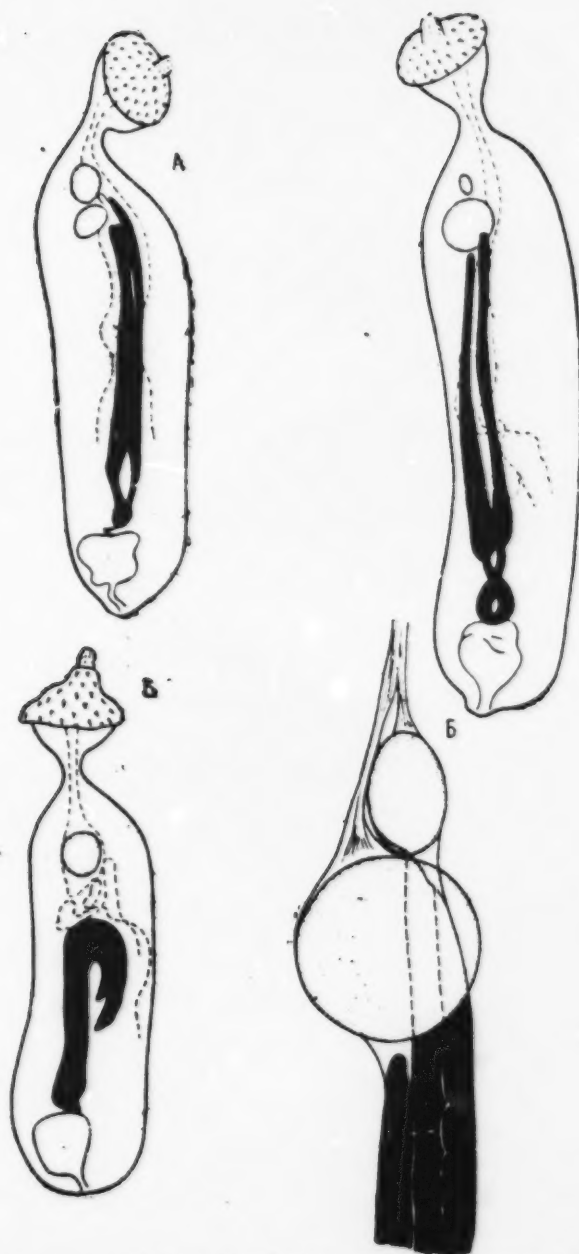


Fig. 2. A - over-all view of thorny-headed worm *B. turbinella* with normally developed testes; B - intermediate form and its testes, enlarged view; C - monorchid *B. turbinella*.

TABLE 1
Dimensions (mm) of males of thorny-headed worms *Bolbosoma turbinella*.

Признак 1	2 Нормальная особь		5 Особь с ненормально развитыми семенниками (2 экз.)	6 Монорхидная особь (3 экз.)
	3 неполовозрелая (3 экз.)	4 половозрелая (7 экз.)		
Длина тела 7	6.7-9.0	16.2-20.3	18.0; 30.3	17.0-17.5
Ширина тела 8	1.2-2.2	2.7-5.2	3.9; 4.5	4.0-4.4
Длина бульбуса 9	0.7	0.8-2.8	1.5; 1.7	1.5-1.7
Ширина бульбуса 10	1.2-1.9	2.4-3.1	2.9; 3.0	3.2-3.5
Длина хоботка 11	0.6	0.6-0.7	0.7	0.7
Ширина хоботка 12	0.5	0.4-0.6	0.6	0.6
Семенники 13	0.23-0.48 × × 0.16-0.38	0.98-1.50 × × 0.80-1.40	0.28-1.34 × × 0.18-1.10 " 0.75-1.60 × × 0.60-1.50	1.25-1.60 × × 1.12-1.50

KEY: 1 - character; 2 - normal specimen; 3 - sexually immature (3 spec.); 4 - sexually mature (7 spec.); 5 - specimen with abnormally developed testes (2 spec.); 6 - monorchidic specimen (3 spec.); 7 - body length; 8 - body width; 9 - length of bulbus; 10 - width of bulbus; 11 - length of snout; 12 - width of snout; 13 - testes.

TABLE 2
Dimensions (mm) of males of thorny-headed worms *Bolbosoma tuberculata*.

Признак 1	2 Нормальные скребни		3 Особь с ненормально развитыми семенниками	4 Монорхидный экземпляр
Длина тела 5	18.5; 20.9		20.3	23.0
Ширина тела 6	2.0; 1.9		2.4	2.5
Длина бульбуса 7	1.7; 1.1		1.2	2.7
Ширина бульбуса 8	2.6; 2.3		2.5	4.0
Длина хоботка 9	0.8; 0.8		0.8	0.8
Ширина хоботка 10	0.6; 0.6		0.6	0.6
Семенники 11	1.01-0.75 × 0.94-0.76 0.91 × 0.50-0.60		0.72-1.10 × 0.20-0.51	1.03 × 0.76

KEY: 1 - character; 2 - normal thorny-headed worms; 3 - specimen with abnormally-developed testes; 4 - monorchidic specimen; 5 - body length; 6 - body width; 7 - length of bulbus; 8 - width of bulbus; 9 - length of snout; 10 - width of snout; 11 - testes.

In both species of worms, "intermediate" specimens between the normal and monorchidic forms were also found, in which one of the testes was underdeveloped. In our material, a *B. turbinella* worm 18.0 mm long had testes markedly differing in size. One of them was 0.28 X 0.18 mm, the other 1.34 X 1.10 mm. We observed a similar picture in worms of this same species with a body length of 30.3 mm. The smaller testis was 0.75 mm long and 0.60 mm wide, the larger, with dimensions 1.60 X 1.50 mm, was equal to the testis of a monorchidic specimen with a body length of 17.5 mm.

A similar picture is observed when sexually mature *B. tuberculata* specimens are compared (Table 2).

With a body length of 18.5 mm, the normally developed testes of a worm of this species had a length of 1.01 - 0.75 mm and a width of 0.94 - 0.76 mm. Another specimen, with a body length of 20.9 mm, had normally developed testes 0.9 mm long and 0.5 - 0.6 mm wide. In a worm of similar body size (20.3 mm) as the preceding, the abnormally developed testes were 0.72 - 1.10 mm long and 0.20 - 0.51 mm wide, respectively. The next monorchidic specimen with a body length of 23.0 mm had a testis 1.03 long and 0.76 mm wide.

The existence of an intermediate form between normal and monorchidic thorny-headed worm specimens indicates that in this case the formation of a monorchid does not occur as the result of fusion of the two testes, but rather as the result of gradual reduction of one of them.

The somewhat larger size of a monorchid by comparison with the norm is

associated with an intensification of its function [sic].

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ON THE MONORCHITIC ACANTHOCEPHALA FROM THE GENUS BOLBOSOMA PORTA, 1908 (Acanthocephala: Polymorphidae)

G. G. Galkina

Report on monorchitic specimens of Acanthocephala from intestine of whales.